



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,282	03/24/2000	Selda Günsel	42053.6USPT	2884

24238 7590 01/27/2004
JENKENS & GILCHRIST
1401 MCKINNEY
SUITE 2700
HOUSTON, TX 77010

EXAMINER

BERNATZ, KEVIN M

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 01/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 01/14/2004

Application Number: 09/534,282
Filing Date: March 24, 2000
Appellant(s): GUNSEL ET AL.

MAILED
JAN 27 2004
GROUP 1700

Valerie K. Friedrich
For Appellants

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 17, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows: Pending claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman, Venier '023, Venier article 1, Babb and further in view of U.S. Patent No. 5,547,593 to Sanechika et al., and U.S. Patent No. 5,128,26 to Ng. Appellants have a typographical error in the patent number of the Sanechika et al. reference.

(4) Status of Amendments After Final

The appellants' statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellants' statement of the issues in the brief is substantially correct. The changes are as follows: appellants failed to include the issue of claims 13 and 14 being substantial duplicates of one another (see Paragraph 3 of the Final Rejection, Paper No. 21).

(7) Grouping of Claims

Appellants' brief includes a statement that claims 1, 11 – 14 and 23 - 37 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8). Specifically, appellants have grouped the claims into 6 individual groups and have argued each group separately.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,012,023	VENIER ET AL.	4-1991
5,364,547	BABB ET AL.	11-1994
5,128,216	NG	7-1992
6,319,600	STIRNIMAN ET AL.	11-2001
5,541,351	PATSIDIS ET AL.	7-1996
5,084,516	TSUCHIYA ET AL.	1-1992
5,547,593	SANECHIKA ET AL.	8-1996
4,566,983	HAYASHI	1-1986

Venier article 1 - Venier C.G., Casserly, E. W., and Gonsel, S., "Tris(2-Octyldodecyl)Cyclopentane, a Low Volatility, Wide Liquid-Range, Hydrocarbon Fluid", IDS reference, pp. 13 1-1 to 13 1-12.

Venier article 2 - Casserly, E. W. and Venier, C. G., "Symposium on the Chemistry of Lubricants and Lubrication Presented Before the Division of Petroleum Chemistry, Inc." Preprints of ACS meeting, Boston 1990, pp. 265 - 271.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 11 - 14 and 23 - 35 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al. (U.S. Patent No. 6,319,600 B1) in view of Venier et al. (U.S. Patent No. 5,012,023), *Venier article 1* (Venier, Casserly and Gonsel - IDS

reference titled "Tris(2-Octyl(dodecyl)Cyclopentane, a Low Volatility, Wide Liquid-Range, Hydrocarbon Fluid") and Babb et al. (U.S. Patent No. 5,364,547).

Regarding the magnetic recording medium and nominal method in claims 1, 13, 14, 30 and 31, Stirniman et al. disclose a magnetic recording medium comprising a non-magnetic support, a magnetic layer formed on the support, a protective layer formed on the magnetic layer and a lubricant layer over the protective layer (*col. 1, lines 15 – 20 and col. 1, line 63 bridging col. 2, line 25*).

While Stirniman et al. disclose using a perfluoropolyether (PFPE) Z25 lubricant (*col. 5, lines 18 – 36*), Stirniman et al. fail to disclose using appellants' claimed cyclopentane lubricants.

However, Venier et al. ('023) and *Venier article 1* teach that appellants' claimed hydrocarbyl-substituted cyclopentane lubricants are known lubricants for use in engines. *Venier article 1* further teaches that the disclosed cyclopentane lubricants provide equivalent or superior physical, optical and wear properties to PFPE Z25 lubricants (*Venier article 1, page 13 1-1, last sentence of 2nd column and sections 1, 6, 6.3.3 and 7; and Venier et al. ('023), col. 1, lines 15 – 26; col. 4, line 43 bridging col. 5, line 47; and col. 7, lines 1 - 5*).

The Examiner further notes that one of ordinary skill in the art would recognize that a lubricant oil possessing good lubricating properties for engines would also be applicable for magnetic recording media, since the lubricating compound is used to solve similar problems - e.g. lubricity between close running surfaces for improved wear resistance (see *Babb et al. – Abstract and col. 1, line 17 bridging col. 2, line 18*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Stirniman et al. to include a lubricant layer meeting appellants' claimed composition limitations as taught by Venier et al. ('023) and *Venier article 1* in order to provide a lubricant possessing equal or superior physical, optical and wear properties versus PFPE Z25 lubricants.

Regarding claims 11, 12, 23 and 24, while neither Venier et al. reference explicitly disclose the lubricant structure claimed by appellants', one of ordinary skill in the art would be motivated to make and use the claimed hydrocarbyl substituted lubricant in searching for a hydrocarbyl substituted cyclopentane, cyclopentene or cyclopentadiene. The necessary motivation rises from ***the expectation that similar compounds will have similar properties***. *In re Payne*, 606 F.2d 303, 203 USPQ 245 (CCPA 1979). The only difference between the disclosed lubricants and the lubricants claimed in the preceding claims is in the choice of the ***non-functionalized*** hydrocarbyl group that is substituted on the identical base compound. The Examiner notes that Venier et al. ('023) teach the general chemical structure of hydrocarbyl-substituted cyclopentane lubricants (*col. 4, lines 43 – 64*).

Regarding claims 25 - 29, the added magnetic head, data apparatus and computer limitations are deemed to be obvious to one of ordinary skill in the art since they are known magnetic head, data apparatus and computer limitations required for the magnetic head, data apparatus and/or computer to function as designed. The Examiner notes that it is old in the art to use lubricants on both the magnetic head

portion and the magnetic recording medium in order to insure adequate running properties and minimal head stiction.

Regarding claims 32 - 35, Venier et al. ('023) disclose adding one or more additives to the lubricant layer meeting appellants' claimed material limitations (col. 5, lines 48 - 63; col. 7, line 62 bridging col. 8, line 25; and col. 24, lines 27 - 53).

Claims 11 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Stimiman et al., Venier et al. ('023), Venier article 1 and Babb et al. as applied above, and further in view of Patsidis et al. (U.S. Patent No. 5,541,351).

Stimiman et al., Venier et al. ('023), Venier article 1 and Babb et al. are relied upon as described above.

Stimiman et al., Venier et al. ('023), Venier article 1 and Babb et al. fail to explicitly disclose a hydrocarbyl substitution meeting appellants' claimed structural limitations (i.e. a dicyclic pentane, pentene or pentadiene).

However, Patsidis et al. teach that bridged cyclopentadiene compounds are known in the art, wherein the bridge can be just a hydrocarbyl CH₂ group (col. 1, lines 28 - 38 and col. 2, lines 19 - 49).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Stimiman et al., Venier et al. ('023), Venier article 1 and Babb et al. to use hydrocarbyl substitutions meeting appellants' claimed limitations as taught by Patsidis et al. since one of ordinary skill in the art would be motivated to make and use the claimed hydrocarbyl substituted

lubricant in searching for a hydrocarbyl substituted cyclopentane, cyclopentene or cyclopentadiene. The necessary motivation rises from **the expectation that similar compounds will have similar properties**. *In re Payne*, 606 F.2d 303, 203 USPQ 245 (CCPA 1979). The only difference between the disclosed lubricants and the lubricants claimed in the preceding claims is in the choice of the **non-functionalized** hydrocarbyl group that is substituted on the identical base compound where Venier et al. ('023) provide the general teaching of hydrocarbyl-substituted cyclopentanes for use as lubricants.

Claims 12 and 24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. as applied above, and further in view of *Venier article 2* (Venier and Casserly - IDS reference from Symposium on the Chem. of Lubricants, Boston Meeting, pre-print, 35(2), 1990).

Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. are relied upon as described above.

Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. fail to explicitly disclose appellants' claimed hydrocarbyl substitutions.

However, *Venier article 2* teaches that Diels-Alder functionalized cyclopentane based materials are known in the lubricating art as equivalents to cyclopentane, cyclopentene and cyclopentadiene based lubricants (*Background section*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Stirniman et al., Venier et al.

('023), *Venier article 1* and Babb et al. to use hydrocarbyl substitutions meeting appellants' claimed limitations as taught by *Venier article 2* since they would be a reasonable expectation that similar compounds would have similar properties. The only difference between the disclosed lubricants and the lubricants claimed in the preceding claims is in the choice of the **non-functionalized** hydrocarbyl group that is substituted on the identical base compound.

Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stimiman et al., *Venier et al. ('023), Venier article 1* and Babb et al. as applied above, and further in view of Sanechika et al. (U.S. Patent No. 5,547,593) and Ng (U.S. Patent No. 5,128,216).

Stimiman et al., *Venier et al. ('023), Venier article 1* and Babb et al. are relied upon as described above.

For purposes of evaluating the prior art, the examiner has taken "functionalized" to mean "an organic group that includes carbon, hydrogen, and a functional group (e.g. a polar group)", as defined by the appellants (specification, page 7, lines 2 – 7).

Stimiman et al., *Venier et al. ('023), Venier article 1* and Babb et al. fail to explicitly disclose using a mixture of a non-functionalized and a functionalized lubricant.

However, Sanechika et al. teach using a mixture of functionalized and non-functionalize lubricants in order to regulate the viscosity and lubricating properties of the overall lubricant, as well as to provide improved low temperature performance (*col. 4, line 65 bridging col. 5, line 7 and col. 6, lines 28 – 46*). Ng teaches that the aromatic

lubricants used by Sanechika et al. are known equivalent core structures to cyclic groups such as appellants' claimed cyclopentanes, since both structures have free electrons available to bond the lubricant to the surface to be lubricated (col. 1, lines 5 – 22; col. 2, lines 23 – 31 and lines 54 – 62; and col. 4, line 3 bridging col. 5, line 54).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. to use a mixture of functionalized and non-functionalized cyclopentane lubricants as taught by Sanechika et al. and Ng since a mixture of functionalized and non-functionalized lubricants would provide improved low temperature performance, as well as allow accurate control of the viscosity and lubricating properties of the mixture.

Claims 36 and 37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. as applied above, and further in view of Tsuchiya et al. (U.S. Patent No. 5,084,516) and Hayashi (U.S. Patent No. 4,566,983).

Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. are relied upon as described above.

For purposes of evaluating the prior art, the examiner has taken "functionalized" to mean "an organic group that includes carbon, hydrogen, and a functional group (e.g. a polar group)", as defined by the appellants (specification, page 7, lines 2 – 7).

Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. fail to explicitly disclose using a mixture of a non-functionalized and a functionalized lubricant.

However, Tsuchiya et al. teach that the addition of polar groups to cyclopentane materials results in improved flowability, heat resistance and electrical characteristics (*col. 1, lines 10 – 20 and col. 1, line 61 bridging col. 2, line 51*).

Furthermore, Hayashi teaches that one of ordinary skill in the art would possess the knowledge that "hydrocarbonyl substituted" as disclosed by Venier et al. ('023) would include functionalized substituents (*col. 2, line 40 bridging col. 3, line 30*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the appellants' invention to modify the device of Stirniman et al., Venier et al. ('023), *Venier article 1* and Babb et al. to include a mixture of lubricants meeting appellants' claimed limitations since a mixture of functionalized and non-functionalized lubricants would allow tailoring of not only the viscosity and lubricating properties, but also the flowability, heat resistance and electrical characteristics, as taught by Tsuchiya et al. and Hayashi.

(11) Response to Argument

Appellants' arguments for the individual groups can be broken down into two main issues. Appellants argue that there is no motivation to modify or combine the references to reach the claimed invention and that even if the Examiner has presented a *prima facie* case of obviousness, the lubricants show unexpected superiority over the prior art. These issues are argued with respect to the independent claims (claims 1, 13,

14, 30 and 31) in group 1 and the arguments directed to groups 2 – 6 are based on the allowability of the above base claims (e.g. "The arguments stated above with respect to the rejections of claims 1, 13, 14, 30, 31 in connection with the *Babb* disclosure and the lack of any motivation to modify *Venier '023* or to combined *Stirniman* and *Venier '023* are incorporated herein by reference"). As such, for clarity the Examiner will simply address the appellants' arguments as they apply to group 1 since groups 2 – 6 will stand or fall with the independent claims in group 1.

l) The alleged lack of motivation to modify or combine the references to reach the claimed invention

Appellants have argued that the Examiner has relied non-analogous art to replace the hydrocarbon lubricant taught in the various *Venier et al.* references with the *Stirniman* fluorinated PFPE lubricant composition. Appellants have argued that the sole teaching one of ordinary skill in the art would derive from *Babb et al.* is that fluorinated lubricants can be used in both engine and magnetic media applications, not that any lubricants could be used interchangeably (e.g. "Thus, nothing in *Babb* teaches all lubricants useful for engines are also useful for magnetic media applications" – page 7 of Brief). The Examiner respectfully disagrees.

The Examiner reminds appellants that it has been held that a prior art reference must either be in the field of appellants' endeavor or, if not, then be reasonably pertinent to the particular problem with which the appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443,

24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Babb et al. provides a clear teaching that lubricants meeting the demands for engines and aerospace applications and lubricants for magnetic recording media are analogous materials (*col. 1, lines 17 – 43 – which refer simply to “lubricants” and not any specific type of lubricant*). One of ordinary skill in the art, upon reading the Babb et al. disclosure, would recognize that a lubricant designed for increased lubricity and wear resistance in one application would be reasonably expected to provide increased lubricity and wear resistance in the other application.

The Venier et al. IDS article (*Venier article 1*) provides a teaching that fluorinated PFPE lubricants are analogous materials to hydrocarbon cyclopentane lubricants (*various comparative data through-out reference*). The combined teachings of the above references would lead one of ordinary skill in the art to the obvious conclusion that (a) cyclopentane and PFPE lubricants are both known lubricating materials possessing analogous lubricating properties (*as taught in Venier article 1*) and (b) lubricants possessing good wear characteristics in a *non-magnetic media* application will possess good wear characteristics when used on magnetic media (*as taught by Babb et al.*). In summary, both cyclopentanes and PFPE materials are known lubricants. Lubricants are known to be necessary in a wide variety of applications, including aerospace, engines and magnetic media. It is deemed that one of ordinary skill in the art would recognize that a lubricant with good lubricating properties in one wear-resistance application would have a reasonable expectation of possessing good lubricating properties in other wear-resistance applications. As such, the Examiner

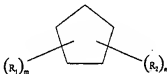
deems that the combined teachings of the relied upon references are analogous and that the Examiner has met his burden for a *prima facie* case of obviousness.

II) The alleged showing of unexpected results for the claimed lubricants over the prior art

Appellants have argued that even if the Examiner has presented a *prima facie* case of obviousness, the as-filed disclosure provides clear and compelling evidence that the claimed invention demonstrates unexpected superiority over the prior art. The Examiner respectfully disagrees.

Appellants' claim 1 recites the following range of materials:

a lubricant layer over the magnetic layer, the lubricant layer includes a hydrocarbyl-substituted cyclopentane as represented by the following formula:



wherein R_1 and R_2 are respectively a hydrocarbyl group, and m and n are respectively zero or a positive integer and the sum of $m + n$ is greater than zero; and

wherein the hydrocarbyl consists of carbon and hydrogen and wherein the hydrocarbyl-substituted cyclopentane comprises at least 29 carbon atoms.

Specifically, appellants' claim 1 covers any hydrocarbyl-substituted cyclopentane of any molecular weight or viscosity provided the number of total carbon atoms is at least 29 (see Table 1 below). To support the entire claimed range, appellants have only

Art Unit: 1773

a single example of 65 carbon atoms (MW = 910 g/mol) compared at a single weight % (~0.1 wt%) to a fluorinated PFPE (ZDOL) lubricant of unknown carbon atom, molecular weight and viscosity.

Table 1: Claimed and disclosed ranges in hydrocarbyl substituted cyclopentanes

	Minimum Disclosed	Minimum Claimed	Maximum Claimed	Maximum Disclosed
Carbon atoms	5	29	None	None
Mol. Weight	910 ¹	~406 ²	None	2250 ³
Visc. @ 100 C	14.7 mm ² /s ⁴	None	None	40 cSt ³
Wt% used	0.055	None	None	0.22

¹: Example on page 30 (Pennzane X-2000). MW obtained from Venier article 1. The Examiner notes that some materials listed on page 10 may be able to be shown to possess MW values less than the explicit embodiment on page 30.

²: calculated on a g/mol basis of cyclopentane with 29 carbon atoms and $\sim 2 \times 29 = 58$ hydrogen atoms.

³: Properties from example on page 24 (weight average MW reported above). The Examiner notes that some materials listed on page 10 may be able to be shown to possess MW values greater than the explicit embodiment on page 24.

⁴: Kinematic viscosity reported in Venier article 1 for Pennzane X-2000.

Therefore, for a cyclopentane possessing any hydrocarbyl-substituent, both known and unknown, along with the entire claimed range of properties shown above

Art Unit: 1773

(Table 1), appellants are relying upon a single disclosed comparison between a 65 carbon atom (910 MW) cyclopentane compound of unknown viscosity at a single 0.1 wt%. And to further stretch the credibility of the comparison, the PFPE compound compared against is an unknown carbon number, unknown molecular weight and unknown viscosity.

As such, the Examiner deems that the data provided by appellants is unconvincing for a showing of unexpected results because the unknowns regarding whether similar MW's or viscosities were compared, whether the improvements would be seen for all compounds above 29 carbon atoms and over what range of weight percents does the improvement result.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Kevin Bernatz
January 21, 2004

Conferees

Paul Thibodeau


Deborah Jones

JENKENS & GILCHRIST, A PROFESSIONAL CORP
1100 LOUISIANA
SUITE 1800
HOUSTON, TX 77002-5214